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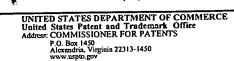
APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,300	07/11/2001	Jeffrey D. Harper	33257/207653	9981

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EXAMINER
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ART UNIT	PAPER NUMBER
2615	4

DATE MAILED: 11/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _11 July 2001_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-48_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-48_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _11 July 2001_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____ .

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _3_ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Objections

1.   Claim 5 is objected to because of the following informalities: the claim recites the

limitation "opertaing system" which should be changed to -- operating system -- Appropriate

correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1 – 11, 13 & 18 – 47 are rejected under 35 U.S.C. 102(b) as being anticipated by

Ju et al (US 5,815,200).

Regarding claim 1, Ju discloses an imaging device (10) for capturing optical image data

(Fig. 1; col. 1, lines 15-20), comprising:

an imager (60) for generating an image signal (Fig. 1; col. 5, lines 65-66);

a memory component (implied by 204) that receives the image signal from the imager

and stores the image signal as image data (col. 6, lines 21-22 & col. 7, lines 20-24);

a processor (51) that executes an exposure control routine by implementing a first module

(implied by 202 & 216) that controls the exposure and gain setting in the imager (col. 6, lines 10-

18 & lines 36-43, wherein initial exposure and gain setting obtained from previous reading

session are executed) and a second module (implied by 206-212 & 220-226) that implements

computations in response to exposure data transmitted from the first module to determine a

· targeted exposure and gain setting (see Figs. 2 & 3; col. 6, lines 18-35 and lines 43-61). ·

Regarding claim 2, Ju shows the imager generating the image signal from multi-

dimensional symbologies (see col. 7, lines 13-17).

Regarding claim 3, Ju also discloses that the processor provides the imaging device with

multi-tasking capabilities (i.e., at least gain and exposure tasking capabilities are performed

concurrently at the power up as shown in Figs. 2 & 3; col. 6, lines 5 – 61).

Regarding claim 4, the processor executes at least one application program (i.e., bit map

decoder) of the imaging device (see col. 7, lines 20-29).

Regarding claim 5, the processor inherently executes an operating system of the imaging

device (see the analysis of claim 1).

Regarding claim 6, the claimed limitations are analyzed with respect to claims 4 and 5.

Regarding claim 7, Ju shows that the first module is implemented in a high priority thread

(see Figs. 2 & 3 wherein initial gain and exposure obtained from previous setting is executed

first).

Regarding claim 8, the claimed limitations are analyzed with respect to claim 7, in which

the thread and task must go together during execution.

Regarding claim 9, Ju discloses that the first module is implemented in an interrupt

service routine ("NO" loop) when the gain and exposure values are not close to the proper values

as shown in Figs. 2 & 3.

Regarding claim 10, the second module is implemented in a low priority thread routine

(see Figs. 2 & 3, wherein the corrections of gain and exposure are executed (206-210 & 220-224)

after executing the initial gain and exposure setting and capturing an image).

Regarding claim 11, the claimed limitations are analyzed with respect to claim 10, in

which the thread and task must go together during execution.

Regarding claim 13, the claimed limitations are analyzed with respect to claims 9 & 11.

Regarding claim 18, the claimed limitations are analyzed with respect to claims 1, 8 &

11, wherein the feedback from high priority module to low priority module (from 210 to 202) is

shown in Figs. 2 & 3.

Regarding claim 19, Ju discloses a method for exposure control in a multi-dimensional

imaging device (see claim 1 and col. 5, lines 65-66 & col. 7, lines 13-17), the method

comprising:

inherently generating an end of frame signal at an imager (see col. 6, lines 21-22 & lines

46-47, wherein an end of frame must be generated at the image sensor in order for the bar code

reader to function properly);

executing, at the central processor (51), a first module (202 & 216) that controls exposure

and gain setting in the imager in response to the end of frame signal (see Figs. 2 & 3 and the

analysis of claim 1, wherein the end of frame signal is the signal indicating the end of frame of

the previous reading session as shown in col. 6, lines 16-18 & lines 40-43);

generating, in the first module, a captured contrast setting, wherein contrast is defined as

the product of the exposure setting and the gain setting (see Figs. 2 & 3 and the analysis of claim

1, in which the gain and exposure setting clearly define contrast setting);

executing, at the central processor, a second module that calculates a target contrast

setting in response to the end of frame signal, the captured contrast setting and stored image data

(Figs. 2 & 3);

generating, in the first module, a subsequent exposure and gain setting for the imager in

response to the target contrast setting; and implementing the subsequent exposure and gain

setting in the imager (see gain and exposure feedback loops in Figs. 2 & 3 and col. 6, lines 16-61

for adjusting gain and exposure in subsequent reading sessions).

Regarding claim 20, the claimed limitations are analyzed with respect to claim 4.

Regarding claim 21, the claimed limitations are analyzed with respect to claim 5.

Regarding claim 22, the claimed limitations are analyzed with respect to claim 6.

Regarding claim 23, the claimed limitations are analyzed with respect to claims 1 & 7.

Regarding claim 24, the claimed limitations are analyzed with respect to claims 1 & 8.

Regarding claim 25, the claimed limitations are analyzed with respect to claims 1 & 9.

Regarding claim 26, the claimed limitations are analyzed with respect to claims 19 & 10.

Regarding claim 27, the claimed limitations are analyzed with respect to claims 19 & 11.

Regarding claim 28, the claimed limitations are analyzed with respect to claims 19 & 12.

Regarding claim 29, the claimed limitations are analyzed with respect to claims 1 & 19.

It is noted that a program storage device is inherent in Ju in order for the processor to execute the

program as disclosed.

Regarding claim 30, the claimed limitations are analyzed with respect to claims 19 & 25.

Regarding claim 31, the claimed limitations are analyzed with respect to claims 7 & 23.

Regarding claim 32, the claimed limitations are analyzed with respect to claims 8 & 24.

Regarding claim 33, the claimed limitations are analyzed with respect to claims 11 & 27.

Regarding claim 34, the claimed limitations are analyzed with respect to claims 10 & 26.

Regarding claim 35, the claimed limitations are analyzed with respect to claims 12 & 28.

Regarding claim 36, Ju also discloses that the second module implements computations

in response to exposure data transmitted from the first module (202 & 216) and the image data

transmitted from the memory component (implied by 204) as shown in Figs. 2 & 3.

Regarding claim 37, the claimed limitations are analyzed with respect to claims 1 & 3.

Regarding claim 38, the claimed limitations are analyzed with respect to claims 1 & 3.

Regarding claim 39, the claimed limitations are analyzed with respect to claim 36.

Regarding claim 40, the claimed limitations are analyzed with respect to claims 3 – 6.

Regarding claims 41 - 47, the claimed limitations are analyzed with respect to claims 7 –

13.

3.   Claim 48 is rejected under 35 U.S.C. 102(b) as being anticipated by Kondo et al (US

5,258,484).

Regarding claim 48, Kondo discloses a video camera for capturing optical image data

that comprises an imager (3) for generating an image signal, an inherent memory for receiving

the image signal from the imager and storing the image signal as image data (see Fig. 2; col. 1,

lines 5-6 wherein the video camera must have a memory for recording image signal); a multi-

tasking operating system, which is the operating system of the video camera shown in Fig. 2, that

allows for simultaneously execution of a high priority module (an exposure control module that

includes iris, shutter and gain controls) for real time control of the imager and a lower priority

module (each module of iris, shutter and gain) that examines the image signal and provides

feedback to the high priority module routine (see Figs. 2 & 3; col. 3, lines 21-60 wherein each

module of iris, shutter an gain is implemented in a lower priority routine in the high priority

routine of exposure control for the video camera).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 14 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ju et al

(US 5,815,200) in view of Moldskred et al (US 5,548,108).

Regarding claim 14, Ju discloses that image signals are received and stored in the

memory from the image sensor (60) in response to the command sends from the second module

under control of the processor (51) as shown Figs. 1 – 3 and as analyzed in claim 1. Ju does not

disclose that the image data transferred from the image sensor to the memory in response to the

command from the second module is performed under a DMA controller. However, such a well

known DMA controller (i.e., 140) is taught by Moldskred for transferring image signals from an

imager (10) to a memory (122) by direct memory accessing method to reduce workload on

processor (120) and also to increase data processing speed in an imaging system (see Fig. 6; col.

6, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art to enhance the

imaging device in Ju by enabling a DMA controller to transfer captured image signals from the

image sensor into the memory in response to command from the second module so that not only

workload on the processor is reduced but also the data processing speed of the imaging device is

increased.

Regarding claim 15, Moldskred teaches that the processor also inherently comprises the

DMA controller itself (instruction code) in order to supervise the DMA controller (140) via a bi-

directional line (176) as shown in col. 8, lines 55-63.

Regarding claims 16 & 17, the claimed limitations are encompassed by claims 14, 15 and

Fig. 6 in Moldskred wherein the DMA (140) is also a programmable logic device and acting as

an interface between the image sensor (via latch 138) and the processor (120).

5.   Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ju et al (US

5,815,200).

Regarding claim 12, Although Ju does not show that the second module comprises

histogram processing, an Official Notice is taken for histogram processing which is executed

after receiving image data from the image sensor to estimate a proper gain or exposure values

before performing further processing and feeding the values back to the first module to control

gain or exposure for the imaging device in a well known method in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to enable

histogram processing in conjunction with look-up table in the second module for highly accurate

estimation of gain or exposure values for the imaging device.

Conclusion

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Nhan T. Tran whose telephone number is (703) 605-4246. The

examiner can normally be reached on Monday - Thursday, 8:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Andrew B Christensen can be reached on (703) 308-9644. The fax phone number for

the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Technology Center 2600 Customer Service Office whose telephone

number is (703) 306-0377.

NT.

ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600